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About the user validation algorithm, based on artificial neural networks

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Abstract

© 2018, Institute of Advanced Scientific Research, Inc.. All rights reserved. In this article, the algorithm of user validation on the base of one's keystroke pattern is examined. In this context, the validation is supposed to be a confirmation of the legitimacy of a user's presence in this or that system. The method in question is based on the application of neural networks similar to Kohonen's Self-Organizing Maps (SOM). As a rule, such kind of networks is used for data clusterization, but within the frameworks of the research, it was used for analyzing users' typical activity. The article highlights some dynamic typing parameters that define the individual characteristics of a user's keystroke pattern. The characteristics that were obtained as a result of the measurements may be used for further analysis with the application of artificial neural networks. The article is mainly focused on the implementation of self-organizing maps that is aimed at the optimization of the examined issue's solution. The authors offered the modification of the SOM model, the neurons of which were complemented by an activation function that was absent in the classical case. It allowed combining the possibilities of self-organizing maps and perceptron-type networks, which gave the possibility to obtain the information about the probability of a successful user validation. The technology may be applied for the validation of students who take remote education courses and social media users.

Keywords

Algorithm, Artificial neural networks, Keystroke, Kohonen, Self-organizing map, SOM, Validation

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